*Entomotaxonomia* (2019) 41(1): 1–7, DOI: 10.11680/entomotax.2019001, ISSN 2095–8609

# A new species of *Tipulodina* (Diptera: Tipulidae) from China

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**Abstract**: A new species of the genus *Tipulodina* Enderlein, 1912, *Tipulodina simianshanensis* Men sp. nov. (South China: Chongqing) is described and illustrated. A key to known species of the genus in China is provided. The new species represents the first record of *Tipulodina* species from Chongqing, China.

**Key words**: crane flies; Nematocera; Tipuloidea; semen pump; key

**中国白环大蚊属 *Tipulodina* 一新种记述（双翅目：大蚊科）**

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**摘要**：记述采自重庆的白环大蚊属 *Tipulodina* Enderlein, 1912 一新种：四面山白环大蚊 *Tipulodina simianshanensis* Men sp. nov.，提供了新种的形态描述和特征插图，以及该属所有中国已知种的检索表。新种为该属物种在重庆市的首次报道。

**关键词**：大蚊；长角亚目；大蚊总科；精子泵；检索表

## Introduction

*Tipulodina* Enderlein, 1912 is a large genus with 52 species worldwide, mainly distributed in Oriental and Palaearctic regions (Oosterbroek 2018). *Tipulodina* was erected by Enderlein (1912) with the type species *Tipulodina magnicornis* Enderlein, 1912 from Indonesia by original designation. Five species of this genus have been recorded from China before this study, four of which are distributed in the southern part of China, with one species from the northern part of the country (Oosterbroek 2018). The genus can be separated from other related genera by its slender leg having a white ring and by the wing with a dark pattern on the tip (Young 1999).

## Material and methods

The specimens were collected from Chongqing using insect nets. We compared the new

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Accepted 24 October 2018. Published 25 March 2019. Published online 27 February 2019.

① Corresponding author, E-mail: menqiulei888@126.com species with all known species based on detailed descriptions and illustrations in literature. Photographs of the male body parts were taken using SOIF XTZ-E stereomicroscope (SOIF, Shanghai, China). The hypopygium of each male was dissected and macerated in 10% NaOH for one hour at 50°C, observed in glycerin and illustrated using a SOIF XTZ-E stereomicroscope (SOIF, Shanghai, China). Dissection was made with the aid of two very fine needles, scissors and fine-tipped tweezers. Body measurements are from the vertex of head to the tip of the hypopygium. All measurements were made in millimeters (mm) with the aid of a digital caliper. The terminology and methods of description and illustration follow Alexander & Byers (1981) and Frommer (1963). The type specimens are deposited in the Systematics and Evolution Laboratory, School of Life Sciences, Anqing Normal University, Anhui Province, China. The first author was responsible for the taxonomic portion of this paper, and thus is the author of the new species.

## Taxonomy

### Key to Chinese *Tipulodina* species

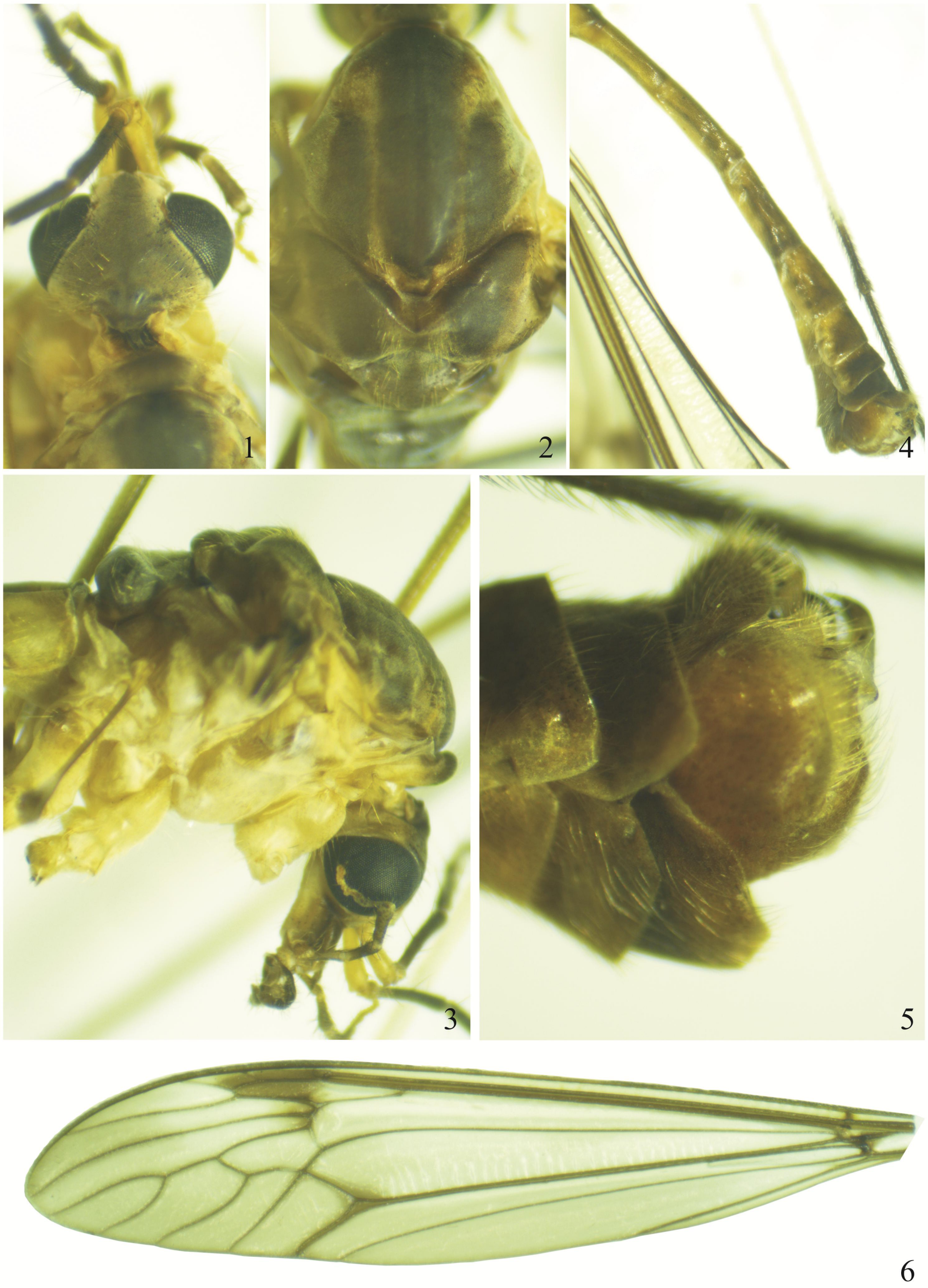
1. Hind tibia with single white ring (Alexander 1923, 16: 76)························· *T. taiwanica* Alexander (Taiwan)
-. Hind tibia with double white rings···································································································· 2
2. Middle femur with white ring immediately before tip (Alexander 1949, 2: 524; Men *et al*. 2016, 41: 96)······
······················································································································*T. xyris* (Alexander) (Anhui, Fujian)
-. Middle femur without white ring········································································································ 3
3. Hind tarsus with outer 3 segments not white (Alexander 1936, 60: 175; Yang 1999, 3: 39)····························
······················································································································ *T. hopeiensis* (Alexander) (Hebei)
-. Hind tarsus with outer 3 segments white·······························································································4
4. Wing tip with distinctly dark pattern······································································································ 5
-. Wing tip with indistinct pattern (Fig. 6)························································ *T. simianshanensis* Men **sp. nov.**
5. Flagellum entirely black; cell sc and stigma black (Yang 1999, 3: 39)················*T. jigongshana* Yang (Henan)
-. Flagellum bicoloured; cell sc and stigma dark brown (Alexander 1938, 66: 444, 445)···································
············································································································ *T. cantonensis* (Alexander) (Guangdong)

***Tipulodina simianshanensis* Men sp. nov.** (Figs. 1–18)

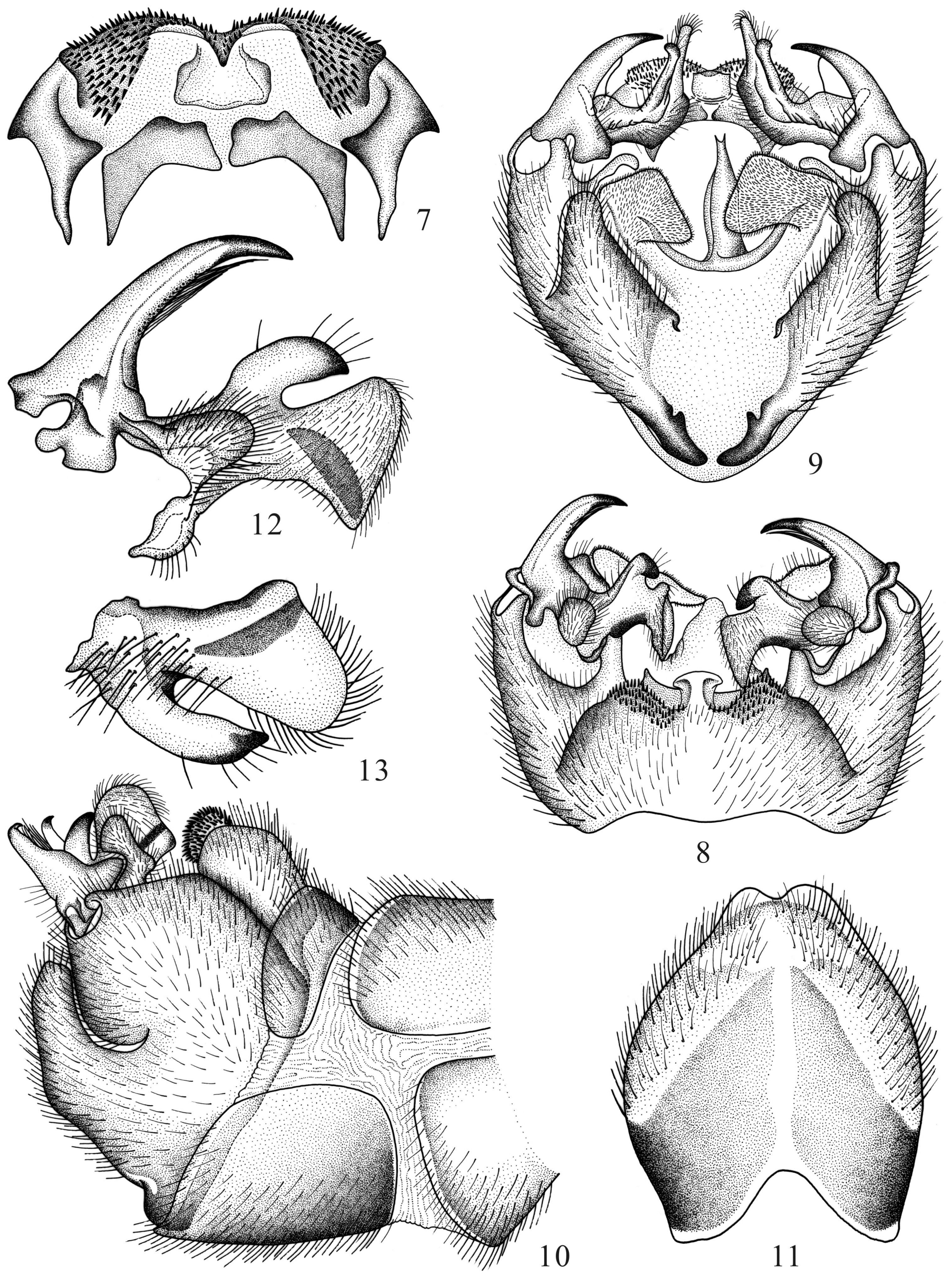
Diagnosis. Antenna with the first two segments yellow, the rest of segments black; prescutum with three brown stripes, median one narrowly suffused with a black median vitta; tergite nine equipped with a cone-shaped process in the middle, hind margin densely covered with black teeth; hind tibia with two white rings; wing light brown, slightly pale on tip; gonocoxite curved, fringed with long yellow setae, gradually narrowed to the tip.

Description. Adult, length (male): body 14.4–14.6 mm (not including antenna, $n$ = 2); wing 17.2–17.4 mm ($n$ = 2); antenna 5.9–6.0 mm ($n$ = 2).

Head. Head yellow with rostrum light brown in coloration on dorsal half. Nasus light brown, densely covered with black setae. Eye black. Occiput and vertex lacking any marking, mostly black, yellow between bases of antennae (Figs. 1, 3). Antenna: 13-segmented, bent backward extending beyond the root of haltere; scape yellow, cylindrical, expanded apically; pedicel yellow, very short; flagellum entirely black, the first flagellomere longest, longer than the length of scape and pedicel together, the rest of segments progressively shortened, basal enlargement of each flagellomere black with abundant black verticils, in which the longest one is subequal to length of corresponding flagellomere, surface of each flagellomere densely covered with short white setae. Palpus light brown (Figs. 1, 3).



Figures 1–6. *Tipulodina simianshanensis* Men sp. nov. 1. Head, dorsal view; 2. Thorax, dorsal view; 3. Thorax, lateral view; 4. Abdomen, lateral view; 5. Hypopygium, lateral view; 6. Wing.



Figures 7–13. *Tipulodina simianshanensis* Men sp. nov. 7. Tergite nine, ventral view; 8. Hypopygium, dorsal view; 9. Hypopygium, caudal view; 10. Hypopygium, lateral view; 11. Sternite eight, ventral view; 12. Gonocoxite, inner and outer gonostylus, lateral view; 13. Inner gonostylus, lateral view.

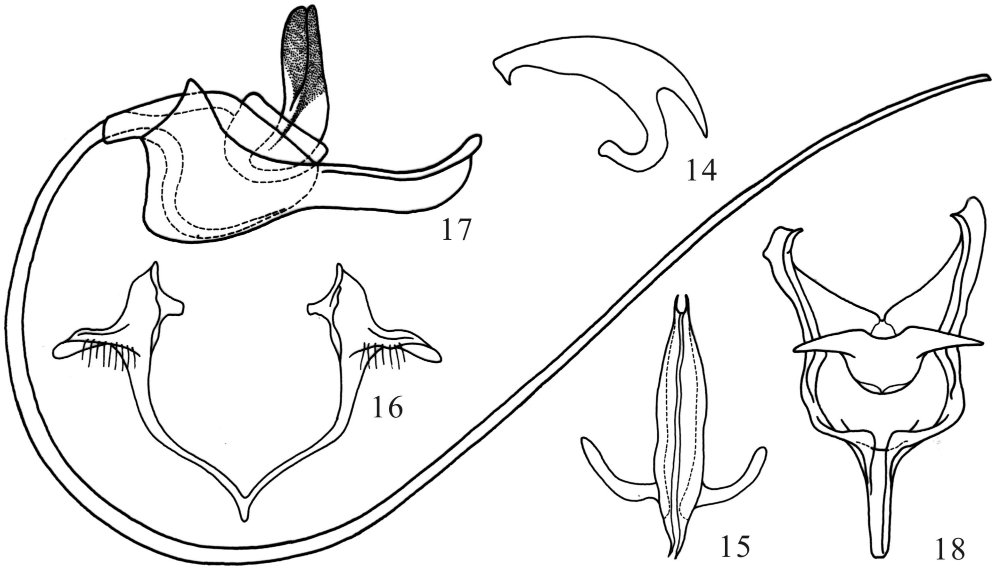
Thorax. Pronotum light yellow laterally, black medially (Fig. 2). Prescutum with three brown stripes, median one with a black median vitta, lateral stripes beyond the half length of median one (Fig. 2). Scutum with two dark brown markings which connected to each other. Scutellum brown with dark median stripe (Fig. 2). Postnotum wholly dark brown (Fig. 2). Pleura entirely yellow (Fig. 3). Leg slender, coxa and trochanter yellow; fore and middle femur yellowish-brown with narrowly black tip, hind femur yellowish brown with black tip distinctly longer than that of other two femora, which one fifth as long as the length of hind femur; fore tibia black with two white rings, the basal one slightly longer than apical one, the black tip one third the length of the apical white ring, middle tibia black, with an indistinct pale ring near base and a white ring near the apex which is subequal in length to the black tip, hind tibia black with two white rings, the apical one distinctly longer than basal one, with black tip one fifth the length of apical white ring; fore tarsus with basitarsus black on basal two fifth, the apical three fifths and the rest of segments white, middle tarsus with basitarsus almost black, its tip and rest segments dirty yellow, hind tarsus with basitarsus black at basal one fourth, the remaining region and segments brightly white. Haltere with stem yellow, knob darker. Wing light brown, cells sc darker than ground color; stigma dark brown, extending to the bases of cells $r_4$ and $r_5$; discal cell transparent, elongated and narrowed; wing tip suffused with slightly smoky gray on cells $r_3$, $r_4$, $r_5$, $m_1$, $m_2$, $m_3$ and $m_4$. Venation: petiole of cell $m_1$ distinctly shorter than discal cell, the latter almost same length as cell m1 (Fig. 6).

Abdomen. Abdominal tergites yellow, narrowly suffused with black on lateral sides and hind margin, sternite yellow; the remaining three segments including hyopygium black (Figs. 4, 5). Hypopygium with tergite nine and sternite nine almost separated from each other, only fused at base (Figs. 8, 10). Tergite nine shallowly emarginated at hind margin, terminated medially into a small angle, a cone-shaped process generated from the middle which points ventrad and is truncated apically (Figs. 7, 8); many small black teeth densely covered on both sides of hind margin (Fig. 7); a pair of boomerang-shaped processes generated from the ventral side of tergite nine (Fig. 7). Sternite nine broader than tergite nine, with a curved incision dividing sternite nine into two parts in lateral view: upper part peach-shaped, concaved apically, lower part narrowed and rounded apically in lateral view, suddenly sunk ventrally, with a pair of lobes which are truncated apically and densely covered with small and short setae; ventral corner strongly sclerotized and blackened (Fig. 9). Gonocoxite broad basally, gradually narrowed to a black apex which is sharply acute and curved, fringed with many long and yellow setae on lateral margin (Figs. 8, 9, 12). Outer gonostylus, a small oval lobe, rounded apically (Figs. 8, 10, 12). Inner gonostylus flattened, the narrowed lobe terminating into an acute and black end, the broad lobe longer than the former, provided with long setae on inner side and short setae on outer surface, suffused with black in middle region and lateral margin forming two distinct dark stripes (Figs. 8, 9, 12, 13). Sternite eight shallowly concaved at hind margin (Fig. 11). Adminiculum curved, with a pair of lateral arms at base (Figs. 14, 15). Genital bridge connected with the base of gonocoxite, broad apically with several small setae, gradually narrowed to the base, converging posteriorly into a small common stem (Fig. 16).

Semen pump. Semen pump with compressor apodeme V-shaped (Figs. 17, 18). Posterior immovable apodeme with two arms elongated and curved dorsally (Figs. 17, 18). Anterior immovable apodeme flattened and short (Figs. 17, 18). Aedeagus elongated, tubular, thick basally, gradually narrowed to the end, more than 4.0 times as long as semen pump (Fig. 17).

**Holotype.** ♂, **China,** Chongqing, Jiangjin District, Simianshan Mountain, 17-V-2017, leg.

Guoxi XUE. **Paratype.** 1♂, same data to holotype.



Figures 14–18. *Tipulodina simianshanensis* Men sp. nov. 14. Adminiculum, lateral view; 15. Adminiculum, ventral view; 16. Genital bridge, dorsal view; 17. Semen pump, lateral view; 18. Semen pump, dorsal view.

Distribution. China (Chongqing).

Remarks. This new species is most similar to an Indian species *Tipulodina monozona* (Edwards, 1932) by the shape of tergite nine which has a median process on ventral side, by the shape of inner gonostylus and gonocoxite (Edwards 1932; Alexander 1971). It can be separated from related species by the front and middle tibia having a single white ring, as well as hind tibia with double white ring (front and middle tibia without white ring, hind tibia with single white ring in related species).

Etymology. The specific epithet is a noun 'simianshan' with Latin suffix 'ensis', referring to the type locality of this new species.

## Acknowledgements

We thank Dr. Pjotr OOSTERBROEK, University of Amsterdam, Amsterdam, the Netherlands, for his valuable web site, the *Catalogue of the Craneflies of the World* (http://ccw.naturalis.nl/index.php), who provides much valuable information about distribution and taxonomy. This study is supported by the National Natural Science Foundation of China (31300551), and the Anhui Outstanding Young Talent Support Program (gxfx2017059).

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